Universidade de Pernambuco
Programa de Pós-Graduação em Engenharia da Computação (PPGEC)

Proposta de Dissertação de Mestrado

Área: Modelagem Computacional

Título: Combining event sequence visualization with data storytelling to support distance learning teachers.

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Descrição:

With the widespread adoption of Virtual Learning Environments (VLEs) to mediate teaching and learning activities, especially in Distance Education, large amounts of data relating to students' interactions with these platforms is becoming available. The challenge of analyzing and extracting knowledge from these datasets led to the emergence of Learning Analytics (LA) (WISE, 2019), an area of research that aims to understand and improve teaching and learning processes through the analysis of data collected in educational contexts.

Teachers who work in distance learning courses are one of the many actors who can benefit from the analysis of such data. If presented appropriately, educational data can help teachers follow the progress of their students, anticipate learning problems and act proactively, and also reflect on their teaching practices (LOCKYER; HEATHCOTE; DAWSON, 2013; MANGAROSKA; GIANNAKOS, 2019; WISE, 2019). One of the most effective ways of presenting educational data to end-users is through Learning Analytics Dashboards (LADs) (SCHWENDIMANN et al., 2017; VERBERT et al., 2020), interactive interfaces that use Data Visualization techniques to communicate and explore educational data.

However, most of the current LADs focus on analyzing the products of learning (e.g.: assignments delivered and formal assessments) or quantifying simple indicators (number of log-ins to the VLE, accesses to the course page, etc.). These approaches fail to explore aspects related to the actual *process* of learning, such as the order in which the students access learning resources (MOLENAAR; WISE, 2022), which can provide to teachers what Sedrakyan, Mannens & Verbert *(2019)* call *process-oriented feedback*.

In this project, we propose to support this type of feedback in LADs through two visualization techniques: event sequence visualization and data storytelling. Event sequences are appropriate data structures to model students' learning trajectories (ZHANG; PAQUETTE, 2023) and when presented to end users through interactive visualizations can be a powerful tool to support decision-making (GUO et al., 2022). Data Storytelling can help teachers, especially those with low visual data literacy, interpret and gain insights from visualizations (MILESI; MARTINEZ-MALDONADO, 2024; POZDNIAKOV et al., 2023).

Therefore, this project aims to explore the potential and limitations of combining data storytelling with event sequence visualizations in LADs to help teachers explore student trajectories in distance learning courses.

** **Observação:** este projeto será conduzido em parceria com o Prof. Jeroen Ooge (Utrecht University, Holanda). Portanto, é imprescindível que o(a) candidato(a) tenha bom domínio da língua inglesa. Familiaridade com Javascript também é desejável.*

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